AMENDMENTS TO THE CLAIMS

Applicant submits below a complete listing of the current claims, including marked-up claims with insertions indicated by underlining and deletions indicated by strikeouts and/or double bracketing. This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of the Claims

1-26 (Canceled)

27. (Currently amended) A receiver for receiving a signal comprising a modulated carrier, with a frame having a first and second training sequences, comprising:

a frequency offset estimation unit for receiving the signal and obtaining initial information relating to a carrier frequency offset from an autocorrelation signal obtained by autocorrelation of the first training sequence of the received signal and for obtaining an estimate of [[a]] the carrier frequency offset from the initial information and an autocorrelation signal obtained by autocorrelation of the second training sequence of the received signal, wherein:

the initial information comprises a sign of the carrier frequency offset,

the second training sequence is longer than the first training sequence, and

the autocorrelation of the second training sequence uses more samples than the autocorrelation of the first training sequence;

a frequency offset compensation unit for compensating the received signal with the frequency offset obtained from the frequency offset estimation unit to form a compensated received signal, and

a time reference determining unit for obtaining a timing reference for the received signal by cross-correlation of the compensated received signal with a known training sequence.

28. (Previously presented) The receiver according to claim 27, wherein the time reference determining unit is adapted to obtain a first timing reference for the received signal by

autocorrelation of the received signal and a second timing reference for the received signal by the cross-correlation of the compensated received signal with the known training sequence.

29. (Previously presented) The receiver according to claim 27, wherein the frequency offset estimation unit comprises means for determining a phase shift in the autocorrelation signal of the received signal.

30. (Previously presented) The receiver according to claim 27, wherein the receiver comprises means to detect a characteristic curve indicative of the known training sequence in a phase of the autocorrelation signal.

31. (Previously presented) The receiver according to claim 27, wherein the receiver comprises means to detect a characteristic curve indicative of the known training sequence in an amplitude of the autocorrelation signal.

32. (Previously presented) The receiver according to claim 30, wherein the characteristic curve includes peaks and/or troughs and threshold values are used to detect the peaks and troughs.

33. (Previously presented The receiver according to claim 32, wherein the threshold values are set dynamically.

34. (Previously presented) The receiver according to claim 31, wherein the characteristic curve includes peaks and/or troughs and threshold values are used to detect the peaks and troughs.

35. (Previously presented) The receiver according to claim 34, wherein the threshold values are set dynamically.

36. (Previously presented) The receiver according to claim 29, wherein the frequency offset estimation unit comprises means for determining the carrier frequency offset from the phase shift.

37. (Currently amended) The receiver according to claim 27, wherein the receiver comprises means to determine [[a]] the sign of the carrier frequency offset from a phase of the autocorrelation signal from a known sequence.

38. (Previously presented) The receiver according to claim 37, wherein the receiver has means for determining a phase shift in the autocorrelation signal from a further known sequence of the received signal.

39. (Previously presented) The receiver according to claim 27, wherein the time reference determining unit comprises means to determine a characteristic curve indicative of a known training sequence in an amplitude of the autocorrelation signal.

40. (Previously presented) The receiver according to claim 27, wherein the time reference determining unit comprises means to determine a characteristic curve indicative of a known training sequence in a phase of the autocorrelation signal.

41. (Previously presented) The receiver according to claim 27, wherein the time reference determining unit comprises means to determine a characteristic curve indicative of a known training sequence in an amplitude of the cross-correlation of the compensated received sequence with the known training sequence.

42. (Previously presented) The receiver according to claim 41, wherein the characteristic curve includes peaks and/or troughs and threshold values are used to detect the peaks and troughs.

43. (Previously presented) The receiver according to claim 42, wherein the threshold values are set dynamically.

44. (Previously presented) The receiver according to claim 27, wherein the receiver is adapted to output the timing reference obtained from the received signal by autocorrelation of the received signal if the timing reference obtained by cross-correlation of the compensated received signal with the known training sequence is not present.

45. (Previously presented) The receiver according to claim 44, wherein the receiver is adapted to otherwise output the timing reference determined by cross-correlation of the received signal.

46. (Previously presented) The receiver according to claim 44, wherein the receiver is adapted to compare the timing reference for the received signal obtained by cross-correlation of the compensated received signal with the known training sequence when present and the timing reference determined by autocorrelation of the received signal, and to output a reset signal if the two timing references differ by more than a threshold value and otherwise to output the timing reference for the received signal obtained by cross-correlation of the compensated received signal with the known training sequence.

47. (Previously presented) The receiver according to claim 27, wherein the timing reference determining unit is adapted to determine a symbol timing from a correlation peak in the cross-correlation of the received signal with the training sequence.

48. (Previously presented) The receiver according to claim 27, wherein the received signals also contain a cyclic prefix, the receiver further comprising: means for obtaining an accurate value for the carrier frequency offset by autocorrelation of the cyclic prefix with the received signal.

49. (Previously presented) An OFDM telecommunications system including the receiver according to claim 27.

50. (Currently amended) A method for processing a received signal comprising a modulated carrier having a frame with a first and second training sequences, comprising:

obtaining initial information relating to a carrier frequency offset from an autocorrelation signal obtained by autocorrelation of the first training sequence of the received signal, wherein:

the initial information comprises a sign of the carrier frequency offset,

the second training sequence is longer than the first training sequence, and

the autocorrelation of the second training sequence uses more samples than the autocorrelation of the first training sequence;

obtaining an estimate of the carrier frequency offset from the initial information and an autocorrelation signal obtained by autocorrelation of the second training sequence of the received signal;

compensating the received signal with the obtained estimate of the frequency offset to form a compensated received signal, and

obtaining a timing reference for the received signal by cross-correlation of the compensated received signal with a known training sequence.

51-52. (Canceled)